video camcorder **100** has a power supply section such as a battery that supplies power to the drive circuit **104** and so forth, a storage section that stores the video signal generated by imaging and so forth, a control section that controls the whole device, etc.

The video camcorder **100** of the present embodiment encompasses also a form of a camera module or an imaging function module obtained by integrating the solid-state imaging element **101**, the optical system **102**, the shutter device **103**, the drive circuit **104**, and the signal processing circuit **105** into a module.

According to the video camcorder **100** that has the above-described configuration and includes the solid-state imaging element **101** of the present embodiment, color crosstalk at the boundary part between the adjacent pixels **7** of colors different from each other can be reduced due to provision of the light blockers **40** at the boundary parts between the in-layer lenses **30** adjacent to each other. Furthermore, because the light blockers **40** are composed of a metal, high light blocking capability can be achieved. In addition, high heat resistance that allows withstanding even against a high temperature process can be achieved, so that the application range can be widened.

Furthermore, by employing the method for manufacturing the solid-state imaging element according to any of the above-described respective embodiments as the step of manufacturing the solid-state imaging element **101** included in the video camcorder **100**, the light blockers **40** can be formed in a self-aligned manner in providing the light blockers **40** at the boundary parts between the lenses of the in-layer lenses **30** provided corresponding to the light receiving parts **3** of the respective pixels **7**. Thus, the accuracy of pattern alignment between the in-layer lens **30** and the light blocker **40** can be enhanced and it is possible to easily respond to microminiaturization and increase in the number of pixels.

The present technique can have the following configurations.

(1) A method for manufacturing a solid-state imaging element, the method including forming lenses that are each provided corresponding to a light receiving part of a respective one of a plurality of pixels arranged in an imaging area over a semiconductor substrate and collect light onto the light receiving parts, forming a light blocking layer by performing film deposition on the lenses by using a material having light blocking capability, and forming a light blocker composed of the material having light blocking capability at a boundary part between the lenses adjacent to each other by etching the light blocking layer in such a manner that the material having light blocking capability is left at the boundary part between the lenses.

(2) The method for manufacturing a solid-state imaging element according to (1), wherein the material having light blocking capability is a metal.

(3) The method for manufacturing a solid-state imaging element according to (1) or (2), wherein the forming the light blocking layer includes forming an adhesion layer for allowing adhesion of the material having light blocking capability to a material to form the lenses.

(4) The method for manufacturing a solid-state imaging element according to one of (1) to (3), further including forming an etching stopper film on the lenses by using a material having etching selectivity with respect to the material having light blocking capability, between the forming the lenses and the forming the light blocking layer.

(5) The method for manufacturing a solid-state imaging element according to (4), wherein a material having a refractive index that is lower than a refractive index of a material to form the lenses and is higher than a refractive index of a material of a layer formed over the lenses with intermediary of the etching stopper film is used as the material having etching selectivity.

(6) The method for manufacturing a solid-state imaging element according to (4) or (5), wherein film deposition of the light blocking layer and the etching stopper film is performed under a temperature condition in which temperature of the lenses is at most 200° C., in the forming the light blocking layer and the forming the etching stopper film.

(7) The method for manufacturing a solid-state imaging element according to one of (1) to (6), further including applying a planarization resist film over the light blocking layer, between the forming the light blocking layer and the forming the light blocker, wherein the material having light blocking capability is conformally deposited in the forming the light blocking layer, and the planarization resist film is etched together with the light blocking layer in the forming the light blocker.

(8) The method for manufacturing a solid-state imaging element according to one of (1) to (6), further including forming a hard mask at the boundary part between the lenses on the light blocking layer, between the forming the light blocking layer and the forming the light blocker.

(9) The method for manufacturing a solid-state imaging element according to (8), wherein the material having light blocking capability is conformally deposited in the forming the light blocking layer.

(10) The method for manufacturing a solid-state imaging element according to one of (1) to (9), wherein the lenses are gapless lenses having no gap between the lenses adjacent to each other.

The present disclosure contains subject matter related to that disclosed in Japanese Priority Patent Application JP 2011-142428 filed in the Japan Patent Office on Jun. 28, 2011, the entire content of which is hereby incorporated by reference.

It should be understood by those skilled in the art that various modifications, combinations, sub-combinations and alterations may occur depending on design requirements and other factors in so far as they are within the scope of the appended claims or the equivalents thereof.

What is claimed is:

1. A solid-state imaging element comprising:

a plurality of pixels arranged in an imaging area over a semiconductor substrate, each of the plurality of pixels including a light receiving part configured to accumulate a signal charge through photoelectric conversion of incident light;

color filters, each provided for a respective one of the plurality of pixels;

a first set of rounded lenses, each provided over a light receiving part of the respective one of the plurality of pixels and each being configured to collect light onto the light receiving part;

a second set of rounded lenses, each provided over one of the first set of rounded lenses, and each being configured to collect light onto the one of the first set of rounded lenses; and

a light blocker provided at a boundary between adjacent lenses of the first set of rounded lenses and a light blocker provided at a boundary between adjacent lenses of the second set of rounded lenses,

wherein the light blocker provided at the boundary between adjacent lenses of the first set of rounded